The Attachment to Public Notice, DA 15-1017 (WTB, rel. Sep. 14, 2015) is a list of 49 applications and associated waiver requests. Note 1 of the Attachment reads as follows:

> The 49 Waiver Requests are essentially identical except for the applicant's name and call sign. For convenient reference, we are uploading to ECFS one representative sample (ULS File No. 0006692050, Application of Go Long Wireless Ltd. to modify Call Sign WQAR512 ("GLW Waiver Request" and "GLW Supplement"). Each of the 49 Waiver Requests is available to the public in the FCC's Universal Licensing System (ULS) at: http://wireless.fcc.gov/uls/index.htm?job=home. Go to Search, select Applications and enter a file number. The search results will include one or more inactive versions of the application and one pending version. Select the link to the pending version to review the pending application as amended to date.

WAIVER REQUEST

Go Long Wireless, Ltd. ("Go Long"), by its attorney, requests a waiver of the MVDDS power limitation as specified in the Commission's *Memorandum Opinion and Order and Second Report and Order*, FCC 02-116, released May 23, 2002 (ET Docket No. 98-206) ("*MO&O*"). In support, Go Long submits the following.

BACKGROUND

In adopting rules initiating MVDDS service, the Commission found that the allocation of MVDDS in the 12 GHz band is in the public interest and reflected a carefully crafted balance of technical and policy concerns. "This balance will result in an efficient reuse of spectrum and the provision of a new service to the public while affording protection to the existing Direct Broadcast Satellite (DBS)....We also believe that this new service will facilitate the delivery of new communications, services, such as video and broadband services, to a wide range of populations including those that are unserved and/or underserved." *See MO&O* at ¶ 2. The Commission went on to state, "Specifically, MVDDS providers will share the 12 GHz band with new NGSO FSS operators on a co-primary basis and on a non-harmful interference basis with incumbent Broadcast Satellite Service (BSS) providers. *See MO&O* at ¶ 3.

The *MO&O* at ¶ 26 states as follows:

> "MVDDS is authorized on a co-primary, non-harmful interference basis as to BSS/DBS and on a purely co-primary basis to NGSO FSS. Each scenario requires somewhat differing approaches for addressing interference protection priorities. The interference protection rules and technical limits we are adopting herein will limit the DBS and NGSO FSS interference potential from MVDDS and avoid 'harmful interference' as defined by Section 2.1 of our rules."

The Commission adopted a power limitation of 14 dBm per 24 megahertz. *See MO&O* at ¶ 198. This power limit was done in an effort to ensure protection for DBS. Ibid.

As will be explained more fully, Go Long is requesting a waiver of the power limitation and to the extent a waiver is needed to provide backhaul service, the instant waiver would also subsume that.

DISCUSSION

The current rules allow MVDDS spectrum to be used for any digital, fixed non-broadcast service. Two-way service would be permitted only by using other spectrum or media for the return or upstream path Backhaul Service requires higher power levels. To facilitate such a service, the Commission must allow higher power levels and so as to achieve meaningful two-way service. It is axiomatic that wireless backhaul services would be vital to complement existing wireless services. It should also be emphasized that even though wireless backhaul is a two-way service, it is a point-to-point service, and therefore it realistically is operating a one-way transmit path, albeit on two different frequencies segments.

WAIVER UTILIZATION

The grant of a waiver would allow Go Long to utilize a Point to Point Antenna. Point to Point Antennas focus their beams (like a laser beam). These antennas are optimal for use if one wants to "hit" one target and in addition are extraordinary receptors of signals beamed to them.

For distances greater than two (2) miles, MVDDS needs to have greater power than 14 dBm (0.25 Watts) to keep the signal strength and bandwidth as competitive as frequencies like 11, 28, and 39 gig. Utilization of Point to Point Antennas are able to focus the signal into a narrow beam that mitigates any possible interference it may cause. It is submitted that the Commission grant a blanket waiver to allow the use of a Point to Point Antenna so as to allow power utilization up to 55 dBm.

The primary concern the Commission expressed in its *MO&O* was that there not be any interference to DBS.

In support of the waiver request, attached to the instant submission is a Technical Statement signed by Alan Pate. Mr. Pate is a technical consultant to Go Long. Mr. Pate in his Statement explains that the utilization of a Point to Point Antenna with an increase in power, while maintaining the existing EPFD limit, would offer the same protection to DBS as the existing rules. Specifically, he states:

> "....[I]t allows for more efficient spatial reuse of the band given the much smaller spatial footprint of a point to point high gain dish antenna versus a point to multipoint (PTMP) sector antenna. Given the huge amount of bandwidth at stake, allowing for a more efficient engineering trade space (whilst maintaining the essential DBS interference protection) is clearly a desirable goal given the demand for backhaul and bandwidth and the shortage of spectrum. While spectrum exists and is being made available at millimeter waves, the 12 GHz band has much better performance in terms of rain fade and so is desirable from a reliable backhaul perspective."

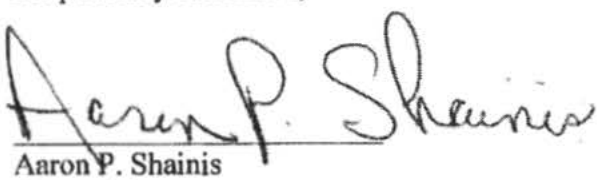
When seeking a waiver of a Commission rule, a party must allege specific facts indicating the existence of special circumstances which justify the requested waivers. The Commission must then examine these facts to determine whether the enforcement of the rule may be contrary to the public interest, particularly where the applicant has made an affirmative showing that the fundamental policy behind the rule would not be undermined by the grant of the waiver. *WAIT Radio v. FCC*, 418 P. 2d 1153, 1157 (D.C. Cir. 1969).

The current power limitation was imposed in 2002, thirteen (13) years ago, in order to protect DBS from interference. As demonstrated, increasing the power limitation where Point to Point Antennas are utilized, while maintaining the existing EPFD limit, will not change the level of interference protection offered to DBS. Thus, the Commission's concerns relative to protection of DBS would not be violated. Moreover, the public interest benefits of a grant of the

waiver would be enormous. In this regard, waiving the power limitation would allow for the implementation of meaningful two-way service. Clearly, more wireless service is in the public interest. Furthermore, the bandwidth itself would be utilized more efficiently. Such a result would also have public interest benefits in light of the scarcity of spectrum.

In light of the foregoing, it is respectfully urged that a waiver of the current power limitation is in the public interest. It is also urged that the waiver be granted post haste, so that the implementation process can be immediately commenced.

Respectfully submitted,



Aaron P. Shainis
Counsel for
GO LONG WIRELESS, LTD.

STATEMENT

Alan Pate hereby states the following:

A. Qualifications

I hold a Bachelors of Science Degree in Physics from the University of St. Andrew, Scotland. I was instrumental in the design and development of the nationwide Sirius repeater network and made significant technical contributions to Sirius's FCC filings in docket 1895--91, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band. My contributions centered around complex interference and co-existence issues between broadcast satellite and terrestrial systems (in particular, between satellite radio network and the immediate adjacent WCS band).

During the period of 2008 to 2013, I was involved in several consulting projects involving the MVDDS band in the areas of equipment development, network and operations. As part of that work, I provided technical contributions in the area of network planning for MVDDS systems which were incorporated into a large scale MVDDS deployment.

B. Technical Statement

The current FCC MVDDS rules incorporate a rigorous process of balancing

different service models, based on the technical foundation of an exhaustive technical study performed more than a decade ago by the Mitre corporation.[1] These rules accomplish the extremely challenging goal of establishing a framework for the sharing of 500 MHz of valuable spectrum between a low signal satellite system and a terrestrial system. The large bandwidth of this co-primary allocation alludes to the enormous potential of this framework in a world of exponentially increasing data demand and scarce spectrum. However, despite a decade of various levels of ability, this goal is yet to be realized.

The central technical parameter in the rules that establishes the overall capacity for co-existence is the **EPFD limit.**[2] This parameter, which includes in its calculation the 3D pattern of the receiving DBS antenna, is the primary mechanism for ensuring that no interference is caused to DBS reception by an MVDDS transmitter. Its value was carefully determined in the Mitre study to ensure there would not even be a small statistical impact on DBS reception and took into account geographic areas and rainfall. In that sense it is conservative, and to date (to the author's knowledge), there have been no interference complaints attributed to MVDDS systems meeting this limit.

The attached waiver request is **NOT** proposing making any changes to this fundamental parameter. Instead, the waiver request proposes a change that would allow a significant expansion in the deployment models that the existing EPFD limits could

[1] The MITRE Corporation Report on Technical Analysis of Potential Harmful Interference to DBS from Proposed Terrestrial Services in the 12.2 – 12.7 GHz Band (ET Docket 98-206).
[2] FCC § 101.105

support (i.e. beyond the single service model that the now 10-year-old rules are based on, namely wide area broadcast TV).

In addition to requiring that the EPFD limit not be exceeded anywhere there is an existing DBS antenna (a necessary and sufficient condition to prevent interference to DBS) an EIRP limit is imposed of 14 dBm/24 MHz. In looking at actual deployments, it is this (very low) limit that has severely restricted the utility (i.e. distance) of the broad sector Point to Multipoint deployments to date and effectively excluded the introduction of other service types (e.g. backhaul).

This waiver request proposes increasing the EIRP cap for the specific cases where narrow beam (i.e. highly directional) antennas are used,[3] while keeping in place the interference protections for DBS that are embodied in the EPFD limit requirements.

The proposal is based on two basic observations:

1) The simple concept that a narrow beam antenna (such as is used on point to point links) has a much smaller terrain "footprint" than a sector antenna (such as is used as the hub for a PTMP system) at the same signal level. As an example, a 2 foot dish has a -3dB beamwidth of approximately 2.7 degrees at 12.45 GHz vs. the 90 degree beamwidth of a sector antenna. The area coverage is approximately proportional to the ratio of the beamwidths, i.e. the area covered by the dish at the -3 dB

[3] Also referred to as Point to Point Antennas.

points is 3% of that covered by the 90 degree sector antenna. Assuming a uniform density of DBS customer dishes, the narrow beam antenna, in this very simple model, has only 3% of the likelihood of causing interference to a DBS dish as the sector antenna has, for the same EIRP.

2) From Dish's public interest filing which summarizes detailed real world testing they performed in Wyoming, two statements provided samples of the simple concept in practice:

"...The point-to-point, highly directional character of such service could mitigate many of the technical problems arising from a co-frequency sharing between DBS and MVDDS..."

"DISH put those simulations to the test in Cheyenne, WY under its experimental STA with the goal of determining whether a narrow beam width antenna and link direction and location was sufficient to mitigate interference into DBS licensees. During those tests, DISH observed no DBS interference from the MVDDS backhaul link if either: (1) the location of the DBS antenna was sufficiently far off axis of the MVDDS main beam, or (2) there was no line of sight from the DBS antenna to the MVDDS antenna on the tower, under conditions of minimal clutter..."

DISH indicates in its public interest filing, that the **actual** probability of preventing interference depends on:

> *"...not only on the system architecture, but also upon the topology and unique characteristics of the individual market, including population density, terrain, ground clutter, position of the backhaul towers, and look angle to the satellites..."*

The use of a narrow beamwidth antenna is clearly beneficial in reducing the overall interference environment significantly over a PTMP sector implementation and allows for the maximization of any potential sharing opportunity that may exist when all these factors are appropriately taken into account.

This simple change dramatically increases the potential options (and associated business cases) for real world deployments of point to point links with competitive performance to, for example, 11 GHz backhaul links. It recognizes that there are many potential sites where a better engineering trade space is possible than the rules permit when narrow beam antennas are used (i.e. more EIRP can be used (that 14 dBm/24 MHz) without causing the EPFD limit to be exceeded at any DBS dish). Or, looked at another way, it allows for more efficient spatial reuse of the band given the much smaller spatial footprint of a point to point high gain dish antenna versus a point to multipoint (PTMP) sector antenna. Given the huge amount of bandwidth at stake, allowing for a more efficient engineering trade space (whilst maintaining the essential DBS interference

protection) is clearly a desirable goal given the demand for backhaul and bandwidth and the shortage of spectrum. While spectrum exists and is being made available at millimeter waves, the 12 GHz band has much better performance in terms of rain fade and so is desirable from a reliable backhaul perspective.

Another consideration as to why more efficient spectrum sharing models can now be applied to the MVDDS band is the significant development in several technology areas since the rules were originally constructed. Specifically, advances in the accuracy and precision of network planning tools and associated data sets, particularly for line of sight type systems such as MVDDS, have made the prediction of interference a much more exact science than it was a decade ago.

The last few years have seen a significant amount of real world MVDDS experimentation and accumulation of knowledge. It is clear from recent filings that one of the two DBS providers, Dish Network, has arrived at similar conclusions to those expressed in this technical statement, namely that increased deployment opportunities could exist with some relief from the EIRP cap for highly directional antennas.

In Dish's STA filing it proposes evaluating an EIRP up to 63 dBm with a directional antenna for point to point links with the intent of establishing whether a backhaul application would be practical in the MVDDS band (assuming maintenance of the EPFD limit).[4]

[4] South.com, LLC, Request for Part 5 Experimental, Special Temporary Authority, OET File No. 0864-EX-ST-2012.

More recently, in the public interest statement filed by Dish associated with their MVDDS license extension, the conclusion is stated explicitly:

> *"Thus, assuming that the Commission grants the necessary additional time and that this testing confirms DISH's findings to date, DISH expects that it will be able to develop and roll out a two-way backhaul system across its licensed spectrum by 2018."*

The technical parameters mentioned in this public interest filing suggest that a level of up to 55 dBm is a reasonable requirement for point to point deployment models.

Based on this shared conclusion with Dish that the MVDDS spectrum is now at a point where alternative deployment models, backed with newer network planning technologies, can release significant amounts of spectrum for point to point applications, we therefore request allowing an EIRP of up to 55 dBm for those transmitters where a narrow beam dish antenna of greater than one (1) ft diameter is used. There would be no change to the DBS interference protection EPFD limits which would still apply and protect DBS service.

CONCLUSION

The integrity of the original reason for the power limitation would not be compromised by a waiver of the power limitation with the attendant use of a point to point antenna. As demonstrated, under these circumstances there would be no interference and a waiver would be justified.

Alan Pate

SUPPLEMENT TO WAIVER REQUEST

Go Long Wireless, Ltd. ("Go Long"), by its attorney, submits a supplement to its March 3, 2015 pending Waiver Request. In support, Go Long submits the following:

The instant supplement is occasioned by discussions with Commission staff. The information submitted is responsive to issues raised in those discussions. At the outset, Go Long seeks a waiver of the following Commission rules:

(a) 101.113, note 11

(b) 101.147 (P)

(c) 101.1407

(d) 101.1411 (a)

A. UTILIZATION OF NARROW BEAM ANTENNA AND MINIMIZATION OF INTERFERENCE

The use of a narrow beam antenna, which confines the signal path to a narrow angle between two (2) distinct points, offers improved potential for better use of the MVDDS band through having a smaller EPFD (interference) footprint for the same EIRP. It should be noted that when considering the choice of antenna to use for a given application, a critical specification is the beamwidth of the antenna. For point-to-point applications, the objective is to have the highest reliability link between only two distinct points. In practice, "reliability" means both providing a strong signal and avoiding interference with other point-to-point links. For this objective, a narrow beam antenna is clearly the best choice. It is also generally true that narrow beam antennas can be better optimized (than wide beam antennas) in terms of design and manufacture to control the width of the beam and significantly reduce levels of offbeam and "behind the antenna" leakage (both which can cause interference). The pending waiver request

states that a dish size of at least 0.3 m (1 ft.) shall be used to ensure that narrow beamwidth antennas with a beamwidth of approximately 5 degrees or less are being utilized when increased EIRP is being applied, therefore ensuring that the EPFD footprint is minimized.

For point-to-multipoint applications (the basic application type upon which the current MVDDS rules are constructed), a wide beamwidth is preferred since then a single antenna can then be expected to deliver a signal to many different customer locations at once. Since they radiate over a wide area by design, and tend to have high leakage outside the main beam, the EPFD footprint can also extend over a wide area. Thus, wide beam sector antennas are not considered for point-to-point applications where interference between links needs to be controlled. Thus, any concern relative to interference is virtually eliminated by the utilization of a narrow beam antenna.

B. NOTIFICATION PROCESS

The waiver request does not in any way disturb any existing notification process. Pursuant to the present rules, an MVDDS licensee can build and operate a site anywhere as long as no "DBS dish of record" falls within the EPFD contour (this includes dishes installed before and up to 30 days after the basic notification is submitted). After that point (notification + 30 days) and assuming all engineering analyses are correct, the DBS provider must take into account the locations of the MVDDS sites in further installations. The instant waiver does not change the existing process in any way.

C. INCREASE IN EIRP

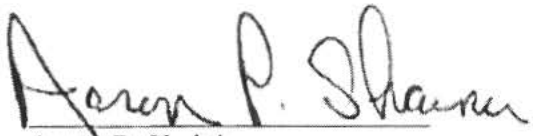
The waiver requests to increase the maximum EIRP allowed under certain additional restrictive conditions, namely the use of narrow beam directional antennas. Predicated on Dish's STA findings, an EIRP limit of 55 dBm is proposed. Therefore, in the case where the waiver was

utilized (i.e. a point to point link using narrow beam antennas), the EIRP of that link could be increased upwards from 14 dBm to a limit of 55 dBm (total), subject to no DBS dishes of record being within the associated EPFD contour (calculated according to the existing rules but using the waiver related EIRP). Depending on the specific situation of the link (e.g. where any dishes were located, length of the link, reliability required), the final operating EIRP for the link might be anywhere in the range of 14-55 dBm, but, more specifically, would be set no higher than the maximum value for which no interference is caused to any dishes of record (as in the existing rules). It is crucial to point out that by increasing the EIRP flexibility whilst maintaining the interference limit (EPFD), the technical parameters can be much better optimized to take full advantage of the spectrum re-use possible in specific geographic areas without increasing the interference burden to DBS dishes of record.

D. CONCLUSION

As previously stated, granting a waiver of the current power limitation would allow for the implementation of meaningful two-way service. It is axiomatic that more wireless availability is in the public interest. Furthermore, the waiver of the power limitation would allow for more efficient utilization of the bandwidth. Clearly, there would be public interest benefits in light of the scarcity of the spectrum.

Respectfully,



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